HOW WILL VOICE-ACTIVATED TECHNOLOGY BE APPLIED
TO POLICE PATROL FUNCTIONS BY THE YEAR 2006?

A project presented to
California Commission on
Peace Officer Standards and Training

by

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This Command College project is a FUTURES study of a particular emerging issue in law enforcement. Its purpose is NOT to predict the future, but rather to project a number of possible scenarios for strategic planning consideration.

Defining the future differs from analyzing the past because the future has not yet happened. In this project, useful alternatives have been formulated systematically so that the planner can respond to a range of possible future environments.

Managing the future means influencing the future, creating it, constraining it, adapting to it. A futures study points the way.

The views and conclusions expressed in the Command College project are those of the author and are not necessarily those of the Commission on Peace Officer Standards and Training (POST).

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SECTION ONE

HISTORICAL DEVELOPMENT OF THE ISSUE

Introduction

Some of us recall the days when there were no computers or the elaborate electronics that

we have come to know and experience today. Our experiences of the past 20+ years has shown

us the value and benefit of such technology-based systems and assures us that these values and

benefits will continue to evolve and maintain a foothold in our industry despite any efforts on our

part to dissuade or ignore it. We have grown so dependent on the use of these tools within our

organizations that its nonexistence has become unimaginable.

Yes, some of these technologies have been applied in our various operations, as the needs

have been identified and the resources acquired. In some cases, the implementation of some of

these programs was necessary so as not to be deprived of the ease of access and/or use of timely

information. As the progress of the various technologies continues, the status quo should never

satisfy us; and the benefits of such technologies should not be allowed to pass us by.

Voice-activation technology was selected for this project because some of these

applications have been noted in action for other disciplines, and it is felt that law enforcement

should not take a wait-and-see approach and just watch what develops. Law enforcement should

take an active role in these developments and become the source from which voice-activated

programs should be fashioned and tested. What better testing ground could one ask for than the

inside of a patrol vehicle where the equipment is diverse and plentiful?

It is very likely that some voice-activated manipulation will be imposed on all of us in

the near future, specifically cell phone use while driving. Such a national imposition would most certainly be required of us as well. This type of technology has already begun to appear in new production vehicles and will surely be applied in other devices to enhance customer appeal, with the hope that such devices mounted in vehicles will not become the primary factor associated with traffic collisions. This is cutting-edge technology that shows tremendous promise for the future. The law enforcement industry should be heavily involved in its development, especially given the fact that a large portion of our duties is performed within a patrol vehicle while driving.

This project will review and summarize some of the developments associated with voice technology and some of their potentials for use. It also includes an examination of the historical development of the issue through a process of environmental scanning, which includes a review of current literature and interviews with subject matter experts. The study also includes the results of a futures forecasting exercise known as the Nominal Group Technique. This exercise was utilized to forecast trends and events that could impact the issue statement. A discussion about those various trends and events, identified by the group of panelists, is included.

Based upon the literature review, the interviews with experts, and the trends and events identified in the Nominal Group Technique exercise, three scenarios, each reflective of a possible future, are presented. A most probable scenario was selected and used as the model for strategy development.

A strategic plan based on the selected scenario has been developed and presented. The strategic plan includes Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis based on the model organization and a transition management plan for implementation of the identified strategies.

Historical Development

The law enforcement industry is certainly no stranger to technology in general. In the profession, there are no shortages of developers and vendors whose focus is to develop and introduce products for the law enforcement community. The 2000 International Police Chiefs' Conference in San Diego certainly demonstrated this, when over one thousand vendors were in attendance to demonstrate their wares. Oftentimes, products and services offered to law enforcement are adaptations or spin-offs of products that were initially developed for private industry, the military or some other unrelated purpose.

It was not that way ten to twenty years ago, when law enforcement was introduced to varying forms of computer-based technology. In time, it became evident that the use of such technology had some measurable benefits that have allowed more efficiency and productivity. Being humans, we initially resist because something is new and does not conform to our zones of comfort or ability. Nonetheless, it was basically necessary to learn and to use these various systems. The evolution and growth of these technology-based systems has not stopped since, and there is no foreseeable end in sight. It is historically apparent at this point that technological possibilities are only limited by one's patience, imagination and creativity.

Such a dependency has been established on these various systems in our day-to-day operations, and their unavailability is so disruptive to the organization that backup systems have been developed and deployed to minimize those negative experiences. For example, just try to assign a beat officer to a patrol vehicle that has an inoperative mobile data computer. Don't be surprised if that officer requests time off instead!

An area of development that shows some promise is the use of voice-activated, or voice-

recognition, technology. This technology is being used in a variety of industries with some degree of success. Law enforcement has only reluctantly touched the surface of its possibilities. This project makes an attempt to bring this technology to the forefront and identifies several applications using it, which may enhance the way day-to-day business is conducted when serving the various communities. Technology has become part of life in almost everything. This intrusion, wanted or unwanted, will most certainly continue. Since it is apparent that this technological evolution is not going to subside, embracing it and developing the positives that it has to offer for the industry is a must.

So now the question is: How will voice-activated technology be applied to police patrol functions by the year 2006? As previously stated, the technological possibilities are only limited by patience, imagination and creativity. Such a comment leaves an extremely broad range of possibilities, so the focus has been narrowed to two primary applications that could realize some limited immediate implementation, with a promising future for increased improvement and enhancements as the technology continues to develop.

Successful and effective patrol officers must be multi-skilled and able to divide their attention on a variety of tasks just to get their patrol vehicles out of the parking lot and onto the street. When seated in their patrol vehicle, officers are faced with an array of equipment with which they must become proficient. Of course, these equipment lists vary from department to department, based on resources and needs. However, just the basic load of equipment for a patrol vehicle generally consists of a multi-channel radio, mobile data terminal or computer, assorted switch panels for all the lights and siren, and a shotgun. Additional accessories could be a cell phone, magnetic tape readers, radar guns, printers and sound and video equipment.

Now, consider the talent and skill that is required to manipulate any and all of this

equipment while driving. To put it in perspective, almost everyone has recently read news

articles or viewed news stories about the dangers of using cell phones while driving. Cell phone

use while driving has often been compared to the likes of drunk drivers and the problems they

create on our highways.[1] Now, take that comparison and add the manipulation and use of a multi-

channel radio, an assortment of lighting configurations, a siren, and a computer with a keyboard.

As one could comfortably assume, the officers place themselves at increased risks because their

attention is divided; and the focus of driving safely is diminished.

This is where voice technology may have some benefit. Rather than have the officer

manipulate some of these tasks by hand and sight, voice command could control the on-board

mobile data computer. The computer would process the request and deliver the result without the

officer's ever using the keyboard or taking his eyes off the road. The computer would

electronically manipulate the equipment, such as a siren, some lighting configuration or whatever

system can be accommodated by the computer system.[2] Another example where voice

technology could be used is the running of license plates while the officer patrols his beat.

The officer could activate the database system by voice and announce the license plate number to

the mobile data computer. The computer would acknowledge the inquiry and process the

information. Once the information was processed, the computer would announce the results.

This entire process could be accomplished while the officer continues to focus on the

environment, thus improving safety for all.

The second voice technology application that can be of great benefit is real time

transcription of police reports. Patrol officers at Buena Park Police Department prepare police

reports by handwriting the report face sheets. The narrative of the report is voiced into a mini-cassette tape recorder. The mini-cassette tape is placed in a large envelope with the completed report face sheets, and the package is forwarded to the transcriptionists for processing. These completed reports are then forwarded to the on-duty Watch Commander, who reviews and approves the reports. Most often, the officer will never see this report again until a copy is printed out for review in preparation for court. Often, this is the first time the officer discovers that there are errors in the report, or that there is additional information that should have been included in the initial report. The lack of convenience for the officer to review police reports prior to submission for approval and processing is the weak link in our report-writing system.

As a result of viewing actual voice-activation applications in operation and interviews with several vendors and subject matter experts, the use of voice technology could mitigate this weakness. The police report face sheets can be programmed into the department computer network and made available from any computer. The officers would then have the ability to pull up any of these report face sheets from the computers in their patrol vehicles. They can enter the face sheet information by voice commands or by using the keyboard. The officers can then dictate the narratives of their reports directly into the mobile data computer through an external microphone, or into a pocket digital recorder that can be downloaded into the mobile data computer. The screen would display the text for viewing on screen, or the computer can read back the report in the officer's voice.

This gives the officer the opportunity to listen to the report to determine its thoroughness and accuracy. As the officers become more and more proficient with the system, they can make the corrections on the spot; and when they feel the report is completed, they can electronically

send it to the on-duty Watch Commander for review and approval. This entire process can be conducted using voice-activated commands or the keyboard. Such an option affords the officer the opportunity to work in a hands-free environment and improves his ability to keep an eye on the surrounding environment while conducting routine business.

These are the two of several applications that could be of benefit to the patrol function at present with today's technology, with some modifications. Numerous companies are continuing to develop this technology, and the future looks very promising for major improvements. There are a number of additional applications that can be incorporated into day-to-day operations; and those can be considered, as they are made available and determined to be of benefit.

In the initial stages of this project, a number of software developers were contacted who produce products that provide voice technology as an alternative to traditional methods of operating a computer. Letters of introduction were sent to five companies with a package of materials that explained the dynamics and purpose of this project. Those companies were: Crown International in Henry, Illinois; Data Agents, Inc. in Williamsburg, Virginia; Dragon Systems in Newton, Maine; Microsoft Corporation in Redmont, Washington; and IBM Speech Systems in West Palm Beach, Florida.

All of these companies responded and included the information that Crown International was actually owned by IBM. Data Agents, Inc. was actually a vendor who sells voice activation software for law enforcement use; Dragon Systems was actually owned by an international corporation based in Belgium named Lemout and Hauspie (L&H); and Microsoft Corporation responded with the information that their company policy does not allow them to review unsolicited submissions.

Of all the companies contacted, L&H and IBM were the most responsive to requests for interviews and information. L&H produces the software program commonly known as Dragon Naturally Speaking. They also offer a software package that is specifically designed for public safety. IBM produces the software program known as IBM Via Voice. Both products are very similar in their application and capabilities. Research for this project suggests that L&H is the current leader in the world with respect to voice technology and possesses about eighty percent of the market in voice recognition technology.[5] When other voice recognition software products are examined, most often it is found that the software is using the L&H program platform but is packaged for another company.

Most police agencies use Microsoft Windows for their operating system and Microsoft Office Package for their day-to-day operations. Historically, Microsoft has programmed all of its Office Package software to be compatible with one another. There is no reason to believe that won't be the case with the new voice recognition program. This may address those compatibility concerns that always seem to pop up when least expected.

An important factor that must be addressed when putting any computer-based system together is the minimum configuration of hardware with the software that is being introduced. Generally, the faster the processor speed and the larger the RAM (256k), the better the software will respond and operate. The system will also require a compatible sound card and a noise-canceling microphone. Today, microphones do not work well in a patrol vehicle environment. The problem is the microphone's inability to completely cancel out the background noise. However, the industry knows that this is a problem; and they are working to develop a microphone to address it. The most common off-the-shelf voice recognition programs in use

today have been identified, and have been listed in Appendix D, along with the minimum

hardware configuration requirements for each.[3,4,5]

<center>Environmental Scanning</center>

Literature Review

Voice technology has become increasingly popular since its development in Europe in the

early 1980's. Futurists of that era believed that the day would come when individuals would be

able to talk to their computers; and the computers would be able to process that voiced data, or

request, and deliver a desired result. The following are some examples of the early applications

of voice-activated systems placed in vehicles:

- ✧ At the Paris Auto Show in September 1982, a company named Katalavox introduced to the
  world voice technology installed in a car. The inventors were able to demonstrate that a
  variety of electrical accessories such as lights, turn signals, wipers, washer and horn could be
  activated by voice-command.
- ✧ In July of 1983, the same company made available to the general public a completely voice-
  operated wheelchair for use by the handicapped.
- ✧ In 1984, the German Ministry of Science and Technology exhibited a Mercedes 190E
  outfitted with the Katalovox system that was capable of activating 50 different functions by
  voice.[6]

As one can see, this technology has been around for some time. The primary motivation

for the early development of this technology was to improve the quality of life and mobility for

the handicapped. The technology has continued to evolve and now offers many applications in

new vehicles being produced today.

In the recent past, the cell phone has become one of the most sought after electronic

devices on the market. One cannot walk the streets or drive down the road without observing a

significant number of people talking on their cell phones. The usage of the cell phone while

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driving has at times been the primary cause in a number of traffic collisions on our roadways. According to the National Highway Traffic Safety Administration's (NHTSA) recent report on the use of cell phones and driving, the use of wireless communications while driving has become a significant factor related to the causes of a number of traffic collisions. The statistical data is currently being collected and analyzed, but their preliminary reports indicate that, as cell phone use has increased while driving, so has the collision rate across the nation. Will this collision rate continue to rise? According to this report, the answer is a definite yes.[7]

The use of these phones while driving most certainly disrupts the general flow of traffic on our freeways. Everyone has experienced the slowing of traffic on the freeways for no apparent reason, until the head of the pack is reached and found to be nothing more than one or two drivers engrossed in a conversation on their cell phones not paying attention to the flow of traffic, much like the times when drivers slow down to observe another driver getting a ticket at the side of the road.

Communities are up in arms about the use of cell phones while driving and the dangers they pose. There is an effort in many communities to enact laws to prevent the use of cell phones while driving. The most recent efforts by New York officials proposed two bills that, if passed, would require motorists to use hands-free devices when using their cell phones while driving.[8] The companies that produce cell phones know this, and they are doing everything possible to prevent its happening. One of the ways they are addressing this problem is with the use of voice technology software. The intent is to cradle the cell phone out of the hand, which allows one to be hands-free. Then one voice-activates the options on the phone, such as turning it on and off, answering in-coming calls, and calling out by voicing the auto dial numbers or the actual phone number itself.

The concept at least gives the appearance that the safety issues are being addressed. If nothing less, it will make it more difficult for outsiders to determine if one is talking on the phone while driving. Cell phones are not the only devices that are being voice-activated in the latest production cars. Many models will allow access to an Internet browser, thus allowing surfing the Internet through voice commands. An option is to have a GPS system installed, which will track every move, as well as provide mapping capabilities; and all of this will be activated

and controlled by voice commands. Mapping instructions will be voiced back, so one doesn't have to look at a screen while driving. Almost all of the electronic devices will be controlled by voice commands, including sound systems and climate control. All of the gauges that monitor the power source will be available and displayed on the windshield when asked for. The intent of the manufacturers is not only to provide the latest and greatest of all of these conveniences, but also to keep both hands on the wheel and eyes on the road. The perception they want one to have is to become a safer driver.[9]

There was a recent article written about a father-son team (referred to as the Duran team) of CHP officers who work as partners on a stretch of Highway 99 in Southern California. The older Duran was nearing the end of his thirty-four year career and had been working a desk job for the past twelve years. He saw an opportunity to work side by side with his son before retiring and returned to patrol to do just that. The older Duran recalls controlling his patrol car's various exterior lights with four toggle switches. His new car's control panel, by comparison, has twelve touch-screen areas for those functions. The older Duran was intending to be the trainer for his son; however, in this case, the reverse was true, as his son was training him on how to use the new equipment. The younger Duran went on to tell his father that early next year the CHP would be breaking in a new voice-activated control system for patrol cars. Just say red light, and the red light comes on.[2]

The story portrayed in this news article is an example of the direction we are headed for, with respect to voice-activated technology. The CHP recognizes the potential for improved safety for their officers, while driving high-speed pursuits, through the use of this voice-activated technology. The ability to keep one's hands on the wheel and one's eyes on the road may have some merit.

Interviews

Several informal interviews were conducted as part of the research for this project. From day-to-day reading of periodicals, it became apparent that the technology associated with voice

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communications was going to have a tremendous impact on the computer industry in the very near future. It was desirable to know what the future had to offer in that regard and how it could be applied in law enforcement, specifically the patrol officer who works in the field.

Identifying the developers of the voice recognition programs was step one. A trip down the software aisle of the nearest computer store was taken. It soon became obvious that Dragon Naturally Speaking was the most prevalent program on the shelves. IBM's Via Voice was another and appeared to be the only competitor in the store. Some research on the Internet showed that Microsoft was developing a similar product, and a company named Crown International out of Illinois had also developed voice recognition software. In The Police Chief magazine, an ad for a company named Data Agents, Inc., who specifically developed a voice transcription program for law enforcement, was found.[10] A list of companies to contact was made, a letter of introduction was prepared, and off they were sent.

Within days, responses began to come in. The first call was from a gentleman who identified himself as Stephen Treisman from Dragon Systems. He was attending a meeting at his corporate headquarters in Newton, Maine, when he was handed the package of materials. Mr. Treisman said he read the contents on his return trip to Southern California, where he is the regional manager for the West Coast. Mr. Treisman said Dragon Systems had just been purchased by an international corporation named Lemout and Hauspie (L&H). L&H, he said, owned approximately 80 percent of the market share in the world on voice recognition software. This comment appeared to be pretty accurate when it was later determined that about 80 percent of the software programs looked at had the L&H voice recognition-programming format. This was also the case in a conversation held with a representative from Data Agents, Inc.

Mr. Treisman said he was very interested in the results of this project and that he had worked with the Los Angeles Police Department in fashioning the Dragon software program for a few of their detectives to prepare police reports. It was agreed that a meeting at a future date, to observe a demonstration of the software and to go over what hardware configuration would be needed to accommodate such a system, was in order. There were a host of other questions about limitations, expandability, training time, costs and many other subjects that would be addressed at that future meeting.

The next call received was from James Cox of Crown International, based in Henry, Illinois. Mr. Cox was interested in the project and the potential desired results. Mr. Cox said the product developed by his company would be able to accommodate the desires identified in the materials, if the hardware configuration met the minimum requirements. The minimum hardware configuration requirements are listed in Appendix D under the Via Voice heading. Mr. Cox went on to say that Crown International developed the voice recognition program and that IBM now owned that software program and sold it under the Via Voice brand name. Mr. Cox identified a number of articles that could be viewed on the Internet for this research, and exchanging e-mail messages throughout the development of this project continued.[11]

A third phone interview was conducted with Rene Griffith of Zyphyr-Tec, based in Rancho Cucamonga, Ca. Ms. Griffith specializes in training groups of individuals in the use of voice- recognition programs. A lengthy discussion regarding the benefits of proper training in the use of the voice-recognition program occurred. Ms. Griffith said that once individuals get accustomed to using this program and become proficient in its use, they will continue to use it because of the convenience and time saved.

Ms. Griffith talked of a 60-day pilot program that is about to begin at Anaheim Police Department. The department will identify eight detectives who will attend two eight-hour class sessions, where they will be trained in the use of the program. The goal of the pilot program is to improve the efficiency of the preparation of police reports by reducing the time needed to prepare those reports using traditional methods, reducing the need for clerical staff, and being able to accomplish this task twenty-four hours a day, seven days a week. Ms. Griffith said if individuals have basic computer skills and are somewhat proficient with Microsoft Word '97, the two eight-hour class sessions would be all the training required. Much like any learned skill, continued practice and use of the program will enhance accuracy and productivity.[12]

Summary

The literature is plentiful in regard to voice-recognition technology in the clerical arena, most notably in the medical field. There have been major improvements in these products in meeting the clerical needs, such as real-time transcription. The literature is really lacking in the area of law enforcement for field use. No doubt, embarking into an area that may have real potential, once the need is identified, is inevitable.

Numerous interviews with support personnel associated with some of these companies throughout this project, as well as with others, have been held. The three interviews mentioned were the most significant and beneficial in providing information and the direction sought for this project. On request, L&H and IBM each recommended a panelist from the Southern California area to sit on the NGT panel as subject matter experts in voice-recognition technology. Those individuals honored that request and were in attendance.

The exchange of information and experiences that resulted from these interviews validated the fact that voice technology continues to improve and is being utilized in a variety of disciplines. It is clear that some of these technologies can be applied to the police patrol function in some limited fashion today, with potential expansive improvement for the future.

SECTION TWO

FUTURES FORECASTING

Nominal Group Technique

The issue in question was: how would voice-activated technology be applied to police

patrol functions over the next five years? To determine what trends or events may come to bear

upon this issue question, a futures forecasting exercise known as the Nominal Group Technique

(NGT) was utilized to develop some insight. On October 11, 2000, a nine-member panel was

convened in Buena Park, California. The panel consisted of a mayor pro-tem, a regional director

for the U.S. Postal Service, a loan officer, two voice recognition software vendors, a police

lieutenant, a college professor, a U.S. Army First Sergeant and a municipal risk manager. After a

brief introduction, an explanation of the purpose of the project was discussed; and the Nominal

Group Technique process was outlined. The group was provided with written definitions of trend

and event and asked to brainstorm trends and possible future events that could potentially

influence the issue question.[13]

Trends

A trend was defined as a series of occurrences which, when viewed together, indicate a

movement in a particular direction. Through a directed process, the group first developed a list of

twenty trends (Appendix B). After completing this list, a discussion was held and similar topics

were combined for purposes of the next step. Panel members were then asked to privately pick

what they each felt were the top trends. After the private selection, votes were tallied; and a final

list of the top ten trends was compiled. Each of the top ten trends was then discussed. Following the discussion, each panel member was asked to privately forecast and record his or her opinion as to the direction and magnitude of each trend in the future. The current status of each trend was assigned a value of 100; and using that as a reference point, panelists were asked to make their forecasts. They were additionally requested to assess the level of concern with which each trend should be viewed on a scale of 1 to 10, with 10 representing the greatest concern. Finally, the average scores from the panelists' forecasts and assessments were summarized in the following table.

Table 1. Trend Summary Table - Averages

Trends	- 5 Years (1-200)	Standard (1-200)	+ 5 Years (1-200)	+ 10 Years (1-200)	Concern (1-10)
T-1	68.3	100	161.1	175.5	8.8
T-2	89.4	100	160.0	182.7	9.1
T-3	30.0	100	109.4	134.4	6.1
T-4	98.8	100	180.5	176.6	8.2
T-5	42.7	100	139.4	145.5	7.4
T-6	114.4	100	152.2	161.6	7.5
T-7	101.1	100	156.6	173.3	8.0
T-8	52.2	100	147.7	183.5	7.4
T-9	33.3	100	158.8	173.8	9.2
T-10	55.5	100	135.0	164.2	6.5

T-1   Accountability of Police Officers

T-2   Personal Safety of Officers

T-3   Level of Attention to Ergonomic Concerns

T-4   Need for Documentation

T-5   Standardization of Technology

T-6   Available Budget

T-7   Costs vs. Productivity

T-8   Reliance on Technology

T-9   Security of Voice-Activated System

T-10 Multi-Tasking Expectations

Trend-1: Accountability of Police Officers

Continuing to add more and more equipment to the toolbox, officers are required to assume increased responsibility and accountability for its use. Our local community and society in general often dictate what those responsibilities, and the accountability for those responsibilities, will be. As crime trends change and communities demand enforcement in different directions, resources are rearranged and deployed to accommodate those changes. Some examples of where this has been accomplished, due to redeployment based on the wishes of the community, are the crimes associated with auto theft and driving under the influence.

Trend-2: Personal Safety of Officers

The interior of a patrol vehicle is much like that of someone's business office, with the exception that it is much more confining and mobile. As the technology has grown over the years, so have the number of pieces of equipment that have been mounted inside this small office. Available space for this equipment is at a premium and extremely critical in its placement, when accommodation for the safety zones is needed for the deployment of airbags and easy, unobstructed removal of a shotgun. Another concern is that, as new equipment is added, a saturation point may be reached where the monitoring and manipulation of too much equipment could detract from the personal safety of the officers.

Trend-3: Level of Attention to Ergonomic Concerns

The design and placement of all the various equipment mounted inside a patrol vehicle is critical. Since there is so little space available, the configuration and accessibility of each piece of

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equipment must be well thought out and tested before installation. Since a majority of this equipment is manipulated while the officer is driving, it must be identifiable by touch and be within reach, to ensure that the distraction from the focus of driving is minimized. The trend that the panel recognizes is that developers and vendors of such equipment do take these ergonomic concerns into account when designing their equipment, and that trend will continue to improve if they wish to remain competitive with other vendors.

Trend-4: Need for Documentation

Without a doubt, this is the information age. As an industry, continuing to document almost everything done is a surety. This trend will continue and expand as the technology allows communicating more effectively and more efficiently with the different cultures and languages within the communities. The panel's feeling is that law enforcement will continue to be called upon to collect and gather more information for a variety of outside agencies that require the data to determine need and allocate resources. Law enforcement is one of several resources to obtain this information because of its accessibility to the community every minute of every day.

Trend-5: Standardization of Technology

Most technology companies try to be proprietary in the design of their specific products. The hope is that they will gain a sizeable market share for their product and that the competition will be at a disadvantage. This causes problems for our industry when enhancements and new systems are added to our existing programs. Oftentimes, denial of the opportunity to enhance a system is experienced because of the unexpected costs to overcome the incompatibility issues.

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Some of our panelists were well versed in futures technology and assured us that the trend on the part of most developers is the desire for some level of standardization for the future. This is partly due to the short period of time it takes to develop and market products before new products to replace them have been introduced.

Trend-6: Available Budget

It was the feeling of the panel that the current and projected economy will support the budgetary funds that would be needed in the foreseeable future to fund and maintain the voice recognition system. If this particular technology system demonstrates a value and benefit to the organization, the funds would be sought at the expense of other systems or programs, or sought through nontraditional means, such as community donations, grants, etc.

Trend-7: Costs vs. Availability

The trends associated with the costs vs. the availability of these products were not a major concern of this panel. It was the experience of those who worked with government agencies that they were rarely the first to try a new technology; and by the time it was made available for their use, the products were plentiful and reduced in price because it had already been replaced by the next updated version. It was felt that these various technological industries live and die on the economic theory of supply and demand. The competition for business will prevail.

Trend-8: Reliance on Technology

There is no question that technological tools are relied on. They have provided an

effective and efficient way of conducting our day-to-day business. This reliance on technology will continue to grow far into the future. As the panel discussed this trend, there was no shortage of stories about some system crashing and the organization coming to a screeching halt while a remedy was worked out. The desire is to encourage the placement of redundant systems to back systems up and to keep them running as smoothly as possible, thus minimizing the dread of systems being down.

Trend-9: Security of Voice Activated System

Security of the voice-activated system was a major concern for the panel. The discussion initially focused on the security of the system from outside the organization. All felt that it would always be a concern because of the constant challenge by individuals and groups to break into the system. However, the group felt that as the technology improves over time, voice print technology would aid greatly in improving this constant threat. Regardless of the security system in place, however, constant monitoring for security breeches should be required.

Trend-10: Multi-Tasking Expectations

Officers now and in the future would be expected to demonstrate a wide range of skills in multi-tasking. The trend suggests that officers will be asked to assume more involvement and responsibility in their interactions with the members of the community they serve. It isn't known specifically what those tasks may be at the moment, but law enforcement has historically been called upon often to be the initial contact or resource in social issues. This is often due to the convenience of being in the community around the clock. The trend strongly suggests that

officers will be expected to be very versatile in performing their duties.

Events

An event was defined as a one-time, singular occurrence. The process utilized to identify

trends was repeated for purposes of forecasting events. A list of fifteen possible events was

generated from the group (Appendix C). The list was also pared down through private voting,

and a final list of eight events was developed. As with the trends, the events were discussed.

Following the discussion, panel members were again asked to privately forecast and record their

opinions. They were specifically requested to forecast, in terms of years, when they felt the

probability of each particular event's first occurring exceeded zero, the percentage of probability

of each particular event's occurring at specified future times, and whether the impact from each

particular event would be positive or negative, relative to the issue. The average scores of those

forecasts is summarized in the following table.

Table 2. Event Summary Table - Averages

Events	Year(s) >0	+ 5 Years	+ 10 Years	Impact (-10 to +10)
E-1	1.7	72.2	89.4	+5.0
E-2	4.6	64.4	91.6	+7.7
E-3	4.2	75.0	87.2	+7.1
E-4	4.2	85.0	98.8	+5.4
E-5	7.3	8.3	29.44	-2.2
E-6	7.2	25.5	55.0	-3.0
E-7	5.2	35.0	61.1	-2.0
E-8	5.6	35.0	59.4	+2.4

E-1 Leadership Changes

E-2 Hands-Free Environment Mandated

E-3 3000 MHz Processor Developed

E-4 Computers Equipped with Voice-Activation as Standard Equipment

E-5 Opposition From Police Unions

E-6 Major Recession

E-7 Elimination of Federal Technology Funding

E-8 National Standards for Reporting Crimes

Event-1: Leadership Changes

The leadership of any organization will set the standard for progressiveness. If the status quo is the standard, there will be very little room for growth and improvement in the area of technology. On the other hand, if the leadership is progressive and willing to take carefully researched risks, then the pendulum will obviously swing in the other direction. The panel felt the challenge will to establish a well thought out balance between the two.

Event-2: Hands-Free Environment Mandated

A hands-free environment within any motor vehicle could be a reality for the future. We are already seeing a variety of vehicles outfitted with optional voice-activated devices, such as sound systems, mapping devices and cell phones. The panel felt that if such laws were mandated for the general public in the future, they would surely be applied to law enforcement as well.

Event-3: 3000 MHz Processor Developed

According to the specialists on the panel, the development of a 3000 MHz microprocessor for computers will be a major event that will take the capabilities of the computers we are familiar with today to unimaginable heights. The communications and access to information capabilities will be enormous. At the time this report was being prepared, the industry just introduced the 1.5 GHz processor. This is certainly the direction indicated.

Event-4: Computers Equipped with Voice-Activation as Standard Equipment

Demands on the part of consumers for voice-activation options may cause computer

manufacturers to build voice-activation technology right into the motherboard of future

production models. There would be no need to add hardware devices to these new computers,

because they would be equipped and ready for use. The panel believes that the manufacturers

will include these advances into their products as standard equipment.

Event-5: Opposition From Police Unions

Police unions play an important role in assuring that those they represent maintain

appropriate and safe working conditions, with a compensation package that is commensurate

with the market rate. When changes or potential changes are made in working conditions, these

conditions or changes should be communicated with the unions to avoid any potential problems.

In some cases, some changes may have to be negotiated and included in the labor contract. There

is always the possibility that imposed changes in the methods officers conduct their day-to-day

business, or changes in their environment, pose a potential threat to an officer's safety. It has been

the experience of the panel that changes such as these would certainly attract the attention of the

police union.

Event-6: Major Recession

History assures us that a recession will be in our future. The economic pendulum is sure

to swing in that direction. In times of recession, the panel believes the continued development of

technology will slow but will still continue to progress. Organizations such as ours will not be in

a position to make major purchases of technology, but will reallocate available funds to maintain

the systems in place, and will obtain upgrades as demands and budgets permit.

Event-7: Elimination of Federal Technology Funding

This is certainly a concern for everyone. There is no reason to believe that grant funds are endless. Grant funds are very political in nature and will only be available as long as the public believes these funds are being utilized appropriately and are necessary to assure their continued safety from the criminal element. The panel all agrees that the real challenge for law enforcement will be its ability to maintain all of these various technological systems after the grant funds run out.

Event-8: National Standards for Reporting Crimes

Law enforcement agencies are required to report statistical data to many groups and agencies throughout the country. The reporting requirements vary from county to county and state to state. Legislation in the future may require all reporting agencies to follow particular standards for reporting crimes. The panel felt the challenge to meet these demands may require additional technological equipment to gather and report the requested information. In addition, they believe we may be required to capture information that has never been collected in the past.

Cross Impact Analysis

Upon completion of the organized brainstorming process, four members of the original panel were utilized to analyze whether, and to what degree, each forecasted event might impact each individual trend. Collective opinions of whether the impact would be positive or negative, and whether the magnitude of the impact would be low or high on a 1 to 5 scale where 5 is the highest, were documented in the following cross impact analysis table.

Table 3. Cross Impact Analysis

EVENT	TREND									
	T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9	T-10
E-1	+1	+2	+2	0	+2	-2	+1	+1	+2	+2
E-2	+1	+4	+3	0	+4	-2	+1	+2	+2	+1
E-3	0	+2	0	0	+2	-3	+2	+2	+3	+1
E-4	0	+3	0	0	+2	-1	+2	+2	+3	+1
E-5	-1	+2	+2	0	+1	0	-1	+2	+2	+1
E-6	-2	-1	-2	0	-2	-4	-2	-3	-4	-1
E-7	0	-1	-2	0	-2	-3	-1	-1	-1	-1
E-8	+2	0	0	+2	+1	-2	+1	0	+1	0

An overview of the cross impact analysis indicates that the trends that would be most impacted overall by the forecasted events are: Personal Safety of the Police Officer (T-2), Available Budget (T-6), and Security of the Voice-Activated System (T-9). Those that would be least impacted are: Accountability of Police Officers (T-1) and Need for Documentation (T-4). It

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was reassuring to know that the panel recognized the potential impacts that any of these events may have on the personal safety of police officers. Personal safety has always been a major concern in this business, and we strive to provide the needed equipment and training to assure that safety.

The impacts associated with local budgets were no surprise in this exercise. The bottom line is always there and has to be taken into account when funding or supporting any program or project. All but one of the forecasted events had a negative effect on the budget. A recession in the economy would certainly cause the reallocation of funds in the respective budgets. The intention at that point would be to save jobs at the expense of material items, such as technology projects.

All of the panelists were very concerned about the security of a voice-activated system. They respect the right to privacy in criminal matters for everyone and fear that these systems are vulnerable to outside hackers and terrorists. The analysis shows that catastrophic events have the potential to detract from the importance of our security efforts to safeguard this information.

Accountability of Police Officers (T-1) and Need for Documentation (T-4) were the two least impacted trends in this analysis. During times of a major event, the organization will most certainly assess the situation and prioritize those things that police officers are accountable for and what will need to be documented within the resources available. When the event passes on, there will always be the opportunity to revert back to past practices. The panel recognized that organizations such as police departments are very adept at adjusting to circumstances of the moment quite effectively and efficiently, thus the minimal impact scores for this analysis.

The NGT process helped to identify a number of trends and events that could impact

future implementation of technology-based projects. The process suggests that existing systems could be impacted by reduced maintenance and/or the inability to make timely updates to existing programs. The exercise was helpful in identifying these potential impacts, which will be discussed in this project.

Scenario Development

The idea behind scenario planning is to draw from one's experience and observations to anticipate what the future may bear. It is impossible to know precisely how the future will play out; but the development of potentially differing scenarios about the future, from which it might be necessary to live and work, may provide insight for good strategy planning as the future unfolds. Scenario development is about helping to recognize and expose those forces that push the future in different directions, which will allow making more informed decisions. Scenarios literally give strategic planners alternatives or choices, which can be used to assist their organizations in moving into the best possible future.[14] The scenarios developed for this study are of three types: Optimistic, Surprise Free, and Pessimistic.

Scenario Number One - Optimistic - December 2006

Officer Weaver had just concluded patrol briefing and was gathering his duty equipment before walking out to his assigned patrol vehicle. This was expected to be a typically busy Friday evening in beat three, which is located in the heart of the city. Weaver walked out to the parking lot and approached his assigned patrol vehicle. As he approached, Weaver announced his name and identification number. The black and white recognized his voice, and the doors unlocked and

the interior lights came on. Weaver asked that the trunk be unlocked; and the trunk lid popped

open, allowing him immediate access to inspect the on-board equipment and place his personal

gear inside. As Weaver was stowing his gear, he thought to himself how inconvenient it used to

be when keys were misplaced and time was wasted trying to locate spares to get one's day started.

After Weaver stowed his gear in the trunk, he closed it and went to the passenger

compartment, where he asked for the shotgun to be unlocked. He removed the shotgun and went

through his customary safety check and replaced it in its bracket. Weaver then took his place in

the driver's seat and asked that the engine be started. As the engine responded and warmed up,

Weaver then asked that the on-board mobile data computer (MDC) activate. The MDC

responded to his command and started going through all its startup procedures and loaded all its

necessary software from its hard drive. Moments later, the MDC asked Weaver a series of

questions about his identity and assignments for that shift. Weaver provided the necessary

responses; the MDC acknowledged, and then, through the use of wireless communications

technology, downloaded Weaver's database from the station's main server.

Weaver recalled those early days when the voice recognition systems were installed and

implemented. Being the young officer that he was, he was excited about the new technology and

the efficiency and accessibility to the vast amounts of instant information that it had to offer. He

remembered the difficulty and frustration the older officers experienced with its acceptance. In

fact, some never accepted it all and ultimately never used it. The older officers likened the MDC

system to that of the computer system portrayed in the movie <u>2001 Space Odyssey</u>; yes, the MDC

was affectionately named HAL by those who opposed it, and that has remained its name ever

since.

Weaver's database contains all of his personal data that will allow him to perform his duties throughout his shift. Some of his personal database files would include any unfinished work that he was unable to complete on his previous shift, any returned work from the Watch Commander that needs his immediate attention, any notes he may have entered for future use, his schedule and calendar, any messages from department members or individuals outside the department, to include his voice mail and e-mail, any subpoenas forwarded from the court, and his personal dictionary for report transcription.

When HAL announced the ready, Weaver asked HAL to conduct a safety check on all of the vehicle's electronics systems. HAL acknowledged, and proceeded to check all the basic vehicle electronics systems, the emergency equipment and lighting systems and the communications system. Once HAL completed the systems check and everything was operational, it announced all systems were a go; and the vehicle was available for service.

Weaver pulled out of the parking lot and placed himself in service as he proceeded to his beat. While en route, as he customarily does, he checks with HAL to see if the State DMV database is up, by running license plates as he drives through traffic. Weaver announces to HAL, "10-29 this plate." HAL announces back, "29's are up." Weaver sounds off a license plate he observes in front of him, "two-lima-oscar-charlie-four-nine-seven." HAL announces back, "10-29-two-lima-oscar-charlie-four-nine-seven." Moments later HAL announces, "no make-two-lima-oscar-charlie-four-nine-seven." Weaver acknowledges to himself, "The system is working and I never had to lift a finger or take my eyes off the road. Does it get any better than this?"

Weaver hasn't even arrived at his beat yet, and the radio is barking out report calls for him to handle. The dispatcher, with the assistance of the CAD system, prioritizes the calls and sends

the information to Weaver's MDC. Weaver asks HAL to give him his next call. HAL announces that the call is a 273.5; the parties involved are husband and wife, and the location is 5468 Western Avenue. Weaver recalls something about that address from the past, so he asks HAL to conduct a history on that address. Seconds later, HAL reports that there was a 415 party on November 15, 2005, and a 273.5 on December 5, 2006, with no weapons involved.

Weaver fears that one of the parties might get injured and feels urgency is a priority, so he wants to arrive there as quickly as possible. He asks HAL to provide him with the shortest route from his current location. HAL electronically maps out a route for Weaver, taking into account his current location from the onboard GPS system mounted in his vehicle. Seconds later, HAL announces directions in full initially, and then announces each upcoming turn until Weaver arrives or requests that the directions cease.

Weaver arrives on scene and finds that the offending husband has left the scene; and the wife is not injured, but is desirous of a report. Weaver obtains the necessary information for his report and agrees to wait for the victim's sister to arrive to transport her to a place of safety for the evening. While waiting, he dictates the narrative portion of the report into his digital recorder. The sister arrives, and the victim is sent on her way. Weaver returns to his patrol vehicle and asks HAL to pull up a blank crime report form. He voices in the information that was not provided on the initial dispatch report or address historical database and completes the face sheet. Weaver then attaches his digital recorder to HAL's USB port and downloads the narrative of his report.

When the download is completed, Weaver asks HAL to read the report back to him. HAL checks the report data with Weaver's established dictionary and makes the necessary grammatical corrections. HAL then reads Weaver's report back to him in his own voice and

writing style. At the conclusion of the reading, Weaver makes a few minor corrections and now feels assured that the report is complete and accurate. Weaver then asks HAL to send the report electronically to the Watch Commander for review and approval. Once completed, Weaver asks HAL for his next call.

Scenario Number Two – Surprise Free - December 2006

Lieutenant Mark Collins was attending the first annual Fulmer County Law Enforcement Technology Users Group as a representative of the newly incorporated City of Santa Mona. Santa Mona was now one of 27 cities in the county. As Mark looked around the room, he was quickly reminded that he and his police department were the new kids on the block. It was evident that everyone knew everyone else in the room, as he observed them greeting each other while they waited for the meeting to get under way.

Captain Tom Ford from the County Sheriff's Department stepped up to the podium and called the meeting to order. Tom welcomed everyone and asked each in attendance to introduce himself, identify what agency he represented, and give a brief description of what he hoped to gain from participating in this users group. The introductions proceeded from one person to the next in the customary fashion.

Lieutenant Carol Johnston announced that she was representing North City, and it was her agency's hope that they could implement a voice technology system in their patrol cars as soon as the funds could be identified. Carol said that the stories that have been reported in the media over the past few years regarding the improved safety for drivers using voice technology is quite encouraging. The need to improve the safety of officers while they perform their various

tasks while driving is critical. Carol went on to say that she hoped this users group would research the latest products available in voice communications, and the results of such efforts would place them in a better position to make the right decisions as they develop and implement this system.

When it was Mark's turn, he introduced himself and identified his agency--Santa Mona PD. Mark went on to say that his agency had only been in existence for a period of six months and that he was hopeful that this meeting would identify the types of technology being used, as well as form some levels of networking with the other agencies in the hopes that such relationships would aid his agency in their continual efforts to establish police operations in their new city.

Moments later, the introductions concluded, Captain Ford resumed the business of the meeting. Ford announced that the county had weathered the energy crisis of the early years of 2000. The county was confident that the new state-operated power company was going to continue to bring the cost of electrical energy to a reasonable, affordable rate throughout the state; and the company was expected to turn a profit by the end of the year. This projected good news, along with the turnaround of the tech stocks in the stock market over recent years, has put the county on the road to economic recovery and a promising economic future. Ford went on to say that most of the cities within the county had also reported similar confidence in their economic futures.

Ford reported that the Chiefs of Police from this county wanted to re-establish the technology growth they enjoyed in years past; and now that the economic future looked promising, their desire was to continue with some of the projects that had been halted due to the

unexpected diversion of some of those technology funds. Ford said that as a result of the Chief's last meeting on this matter, they established the Fulmer County Law Enforcement Technology Users Group and asked the Sheriff's Department to host the first meeting. The intended goal they expect from this users group was to establish a clearinghouse for such things as: shared knowledge and experiences, the research of technology projects for future development and implementation, the minimization of duplication of efforts by different agencies, the establishment of compatibility amongst the various technology systems, on-going consideration for networking and communications links to share information, and to make purchases of products and services in larger quantities to take advantage of reduced costs for volume sales.

There was an air of excitement being felt in the room as Captain Ford continued to outline the goals of the users group. Mark was thinking to himself, "This is exactly what is needed for our new agency. The Chief will be pleased with what could be accomplished here, and what this group can offer will most certainly be of benefit."

Scenario Number Three - Pessimistic - December 2006

Lieutenant Stephens was seated at the briefing table awaiting the arrival of his Watch II officers. The officers filed in one by one and took their usual seats at the table as the scheduled start time approached. Lieutenant Stephens had already prepared the duty roster for the evening and was reviewing his outline from a presentation he made to the City Council the previous afternoon on the state of the department's technology systems at present and in the foreseeable future. Lieutenant Stephens was not looking forward to this briefing, as he was sure the session would turn into a whining complaint session, which would only sanction the declining morale

felt by the personnel of the department.

The officers had all arrived. Lieutenant Stephens began the briefing by assigning the usual patrol vehicles and beats to the officers. Stephens went over the event log from the previous 24 hours and provided detailed information about the particular events that would require the personal attention of the beat officers. The officers were instructed to write this information down in their note pads, because the crime information database system they normally access from their mobile data computers had been experiencing problems in the recent past; and it was rather hit and miss as to whether the system was working or not. As the officers wrote their notes, you could hear the grumbling of frustration and displeasure with the condition of the department's technology systems. The business associated with the daily briefing was now completed, and Stephens announced he was going to discuss the results of his presentation to the City Council from the previous day. You could hear the grumbling start up again because the officers had experienced these problems firsthand while trying to perform their day-to-day duties; and they assumed that the lieutenant really had nothing new to report, except more doom and gloom for the future.

Lieutenant Stephens began the discussion by reminding everyone that the city was continuing to feel the financial effects of the recession that began in 2002. He went on to remind everyone that the grant funds from state and federal agencies that were earmarked to replace the existing systems had been diverted to other national and state needs, and there has been no indication that new funding would be made available anytime soon. Stephens pointed out that the City Council responded to that report, saying that they will continue to remain within budget and their intent was to save jobs and to at least provide the necessary basic service to the community

within those means. The Council feared reliving the devastation of those deficit years of the late 80's and early 90's. Their message was made quite clear that they had no intention of revisiting those trying times.

Lieutenant Stephens went on to report to the group that the technology-based systems within the department and in the patrol vehicles were outdated and wearing out. Some of the systems have been shut down, because the confidence level that the systems will remain stable has been lost amongst the staff. The constant transition from the technology systems to the older methods is so disruptive to the organization's overall operation that continuing to use the older methods has proven to lessen some of those frustrations. What is the downside? We lose the luxury of ease of accessibility to needed information in a timely fashion, efficiency in our reporting requirements and the morale of our personnel.

Just when you think it can't get any worse, the department's in-house technology analyst has been so frustrated with trying to keep these systems operational that he has given notice to seek employment elsewhere. It's not a pretty picture, and it's probably going to get worse before it gets any better.

Three very different scenarios were presented showing the use and availability, or unavailability, of a variety of voice technology systems for patrol officers. All of the scenarios show varying degrees of dependency that can and will develop within an organization when such systems are in existence. Organizations must be aware of and willing to assume the responsibilities associated with those dependencies, and to promote the positive benefits and to minimize the negatives.

SECTION THREE

A STRATEGY FOR THE FUTURE

Introduction

The research shows that voice-activated accessories for personal vehicles are being

developed and introduced to the driving public today. As this driving public grows accustomed to

the conveniences and uses of this kind of technology, the trend is sure to continue. The

technology industry will respond with a diversity of applications that will surely be made

available for police vehicles of the future. It is inevitable that voice-activated technology in some

form will be an option that law enforcement will have to consider. As an industry, we must be

prepared to recognize voice-activated technology's potential uses, its benefits and detractions,

and to develop a strategy to incorporate those applications that show promise.

Each of the scenarios presented in Section Two represents potential futures that could

face most any law enforcement agency in the year 2006. Although any one of them could happen,

the optimistic scenario has the greatest likelihood of occurring. For that reason, a strategic plan

that is consistent with the optimistic scenario will be developed and presented. The strategic plan

will consist of a description of the present situation of the Buena Park Police Department, an

assessment of the stakeholders, and an overview of strategies that will be employed in the effort

to make the optimistic scenario a reality.

The Situation

The City of Buena Park is centrally located in Southern California, and its resident

population is approximately 75,000. Buena Park also enjoys a transient tourist population that exceeds 3.5 million annually. It should be noted that the annual tourist population has increased from year to year; and this trend is expected to continue, most likely due to the new developments occurring at Disneyland. The City is home to world famous Knott's Berry Farm, Medieval Times Dinner and Tournament and Movieland Wax Museum, to name a few. The City is governed by a five-member city council under the council/city manager form of government.

The Buena Park Police Department has been in existence since 1953. It is a full-service law enforcement agency and is structured in a conventional, bureaucratic hierarchy. The Department has 141 full-time employees, 96 of whom are sworn officers. The department is also supported by a variety of part-time employees and volunteers that exceed 120. The Department is organized into two divisions, Operations and Support, under the Office of the Chief of Police.

The department is in the process of updating its Mobile Data Terminal (MDT) system, with Mobile Data Computers (MDC's) procured through a joint agency state grant. The challenge for the department is to assess and predict what future technologies will be available over the next five years. Once determined, the questions then revolve around whether that technology will be compatible with this newly acquired equipment, and how that new equipment should be configured to accommodate those new technologies, before taking possession of it. There is no question, based on current developments and reports, that voice recognition/activated technology will be the products that will become the norm in the industry. If improved efficiency and officer safety prove to be the underlying benefits from the use of such technology, it is certainly of interest to investigate its potential uses in the department.

<center>SWOT Analysis</center>

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of the Buena Park

Police Department was conducted by selected members of the department who possess

experience and knowledge about the various technologies that are available for use by law

enforcement. The SWOT analysis is intended to assess the department's internal strengths and

weaknesses, as well as external opportunities or threats that could impact a strategic plan. The

results of the analysis are as follows:

Strengths

- Buena Park Police Department (BPPD) is very progressive and innovative in its approach to improving its efforts to serve the community.

- BPPD is one of the most technologically advanced law enforcement agencies in Southern California.

- BPPD has a history of seeking out and obtaining the necessary funds to develop and implement its programs.

- BPPD has a number of technology literate personnel who readily recognize the value of such programs and systems for potential use in the department.

- BPPD has a number of personnel who volunteer their time and efforts to make these programs and systems work.

- BPPD has experienced tremendous success in developing and implementing new programs and technology systems that oftentimes are viewed and copied by other

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law enforcement agencies.

- BPPD personnel often participate in the development of new programs and systems and ultimately become the salesmen for those who will utilize it in the future.

- BPPD enjoys a very positive and supportive working relationship with other City Departments, the City Manager and the City Council.

Weaknesses

- BPPD is quickly reaching a saturation point for in-house technical support personnel to maintain the various systems currently being used.

- BPPD may reach a point where there are so many systems in place that the personnel will not have the capability to become proficient in all of their applications.

- BPPD is always looking for new technology systems to enhance its enforcement efforts and tends to lose interest in the older systems already in place.

Opportunities

- Technology is advancing at a phenomenal rate, with much advancement having direct applications to law enforcement.

- Open dialogue and education with the technology industry, such as local developers in one's community, can offer many opportunities for the development of future applications in law enforcement. A secondary benefit when working with a local company is the long-lasting relationship that will develop into a

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partnership for other projects in the community.

- Many companies seek organizations such as law enforcement to test their products for the market. Such opportunities often bring tremendous benefits at little or no cost to the organization.

- There are countless federal, state, and private grant opportunities available for law enforcement. Oftentimes, it takes nothing more than seeking them out.

- There are many opportunities to work with other law enforcement personnel who share similar interests and ideas, with the goal of making the profession more attractive, efficient and safe for the personnel who use it.

Threats

- The organization can get so caught up in the technology that it will lose sight of the basics of law enforcement.

- The organization will become so dependent on the technology that it will feel there is no alternative action to consider when the system fails to perform.

- Jealousy will be shown by other city departments when they are not afforded the same opportunities to benefit from these technologies.

- The grant funds dry up, or the competition to compete for available funds becomes more difficult, and/or awards are few and far between.

- The leadership changes in the organization; thus, the attitude toward progressive improvements in technology has less of a priority.

-       Philosophical changes in the City Council, as new members are elected to office and priorities change.

-       The needs of the community shift to other areas not related to law enforcement.

-       Recession in the national or state economy.

Strategic Development

Researching this project presented the opportunity on several occasions to observe voice recognition programs in action, first hand. It was apparent from the start that once the software vendors find out that some interest is shown in their product, they attack from every direction, with promises that your needs will be met and exceeded beyond the wildest of dreams. One of our captains was told about one of the product demonstrations observed; and he was so impressed that his immediate response was, "I like it, go buy it." The green light was appreciated, but no preparation to initiate such a system could be done without some additional research and planning. The captain was told that his support was appreciated, to hold that thought, and to expect us back when all was ready.[15] Our organization strives to provide the very best service possible to the community. It is recognized that society expects us to make communities as safe as possible, using all the tools that are available within our means. The information age is here, and those served expect to be provided any and all information obtainable in the most efficient manner possible. The implementation of voice technology into existing computer systems is a natural progression for meeting those needs that the community expects.

The voice recognition technology is already available to us. There are many applications that can be implemented today, but the immediate future holds major advancements in this

technology that will be difficult to ignore. The national concerns over cell phone use while driving is almost a daily story in the media these days, and voice technology developers are scrambling to meet those needs in cell phones before their use is outlawed across the country. Patrol officers in the performance of their day-to-day duties experience these same safety concerns. Certainly, voice technology will be an option made available to officers in the future to aid them in performing some of their routine tasks while they drive. If some of these tasks can be performed while the officer keeps his hands on the wheel and looking forward, the benefits may be improved safety for our officers and the public at large.

Almost everything in life has a cost associated with it. Technology is not cheap, and funds can be wasted if a particular project is not researched to the fullest. Our organizations usually survive all of the ups and downs of the economy. In recent years, the economy has been very generous; and certainly, advantage of those opportunities has been taken. Realistically, recognition of the fact that the good times are not never-ending is imperative. Even in bad times, it has been our very creativity in identifying resources to finance some of our projects that have served us well. In all probability, that quality will not vanish anytime soon; continuing to work with community leaders and businesses to develop partnerships which insure maintenance of a level of service that communities expect will be necessary.

Wireless communications is another advancing technology that is sure to take us in a new direction. The running of cables all over the countryside and throughout the buildings where work is done certainly has some environmental impact. The production of these materials also has an effect on our nation's natural resources, including the precious fuel used to produce them and transport them. The ability to communicate with the vast number of resources available to

law enforcement can only be enhanced through wireless communications.

The political leaders recognize the value of the technology-based programs that run throughout city government. As in any organization, these systems have made us grow dependent on them; and we are committed to maintaining and enhancing these various systems to keep them operational. Several technology grants have made it possible for the department to establish a number of systems. When communities benefit from the use of these programs, political leaders benefit from the satisfied community members they serve.

Strategic Plan

The ultimate purpose of this strategic plan is to reveal how voice-activated technology will be applied to police patrol functions over the next five years. The optimistic scenario depicted earlier in this project offers several important considerations for the development of this strategic plan. The following recommendations are submitted for consideration in assisting the department in achieving this goal:

1. The department should not ignore the talents of its personnel. Many projects are formulated, implemented and managed by personnel who have tremendous talents in technology areas that are completely unrelated to law enforcement. The fact that they also have experience in law enforcement only enhances successful results.

2. The department should seek and share knowledge and experience about voice-activation technology with other police departments. There is no need to reinvent the wheel. It would be presumptuous on our part to think we are the first in this industry to consider the use of this technology in our patrol vehicles. The research suggests

otherwise. The gathering and sharing of this information has far reaching benefits that would minimize duplication of effort, thus saving valuable time and precious resources.

3. The department should be attentive to the research and development of voice-activation technology in other disciplines. Oftentimes, these already developed products can be adapted to law enforcement needs. For example, the medical field is required to prepare and maintain meticulous records on patients. Because of this tedious task, they have developed a variety of voice-activation programs to accommodate their needs. Law enforcement has similar requirements to prepare detailed historical documents. Logically, one could assume that some of the programs being used in the medical field could be adapted and applied to law enforcement. An inquiry may stir some interest and the sharing of ideas.

4. The department should determine if there is a common interest and/or need for voice-activation communication products within other police departments. The issues associated with the bottom line are always a factor on projects such as this. There are financial benefits to be gained when you can participate in group or volume purchases.

5. The department should check out vendors very carefully. We all have horror stories to share about the lack of support after the sale, or after the warranty expired. Reputable vendors are sometimes worth the extra expense to assure support when things go wrong. Plan with the idea that it will go wrong; that will aid you in asking the right questions before the contract is signed. We investigate serious crimes thoroughly with

no stone unturned. That attitude should be applied when researching and shopping for technology products.

6.   The department needs to identify all of the potential stakeholders who could or will have an effect on the success or failure of this project. Examples of potential stakeholders that could be considered are the City Manager, the Chief of Police, a representative from the Police Officers Association, and the police department's Database Administrator. Once identified, they need to be informed of the intent and the benefits, and encouraged to provide input and support. A support group can be formed, from which there could be a free exchange of ideas and information. A sign of success is when stakeholders turn into salesmen!

7.   The department needs to identify a project manager with the authority to make the tough decisions. A timeline for the project must be established with a reasonable balance for flexibility. The technology business is very unsettled and can change with the wind. These kinds of projects can take on a life of their own if the project manager can't bring it to a close.

The purpose of any strategic plan is to educate and to obtain as much information from as many sources as possible, recognize the negatives as well as the positives, and work through them until everyone reaches some level of satisfaction. Surprises are not popular, especially for those who may have a stake in the outcome. It is much easier to get a project off the ground and into the implementation stage if those who would be affected have an opportunity to participate in its development.

SECTION FOUR

TRANSITION MANAGEMENT

Now that the research has been concluded and a decision has been made to bring voice-activated technology for the patrol function into an implementation phase, a strategy for managing that transition must be established. The foundation of this transition strategy requires the identification of the critical mass, the development and implementation of a specific transition plan, and the identification of a transition management structure.

Critical Mass

A project of this magnitude, if conducted thoughtfully and inclusively, should involve, and has involved, a large number of individuals. These individuals obviously have a stake in the outcome of the project, regardless of whether their roles were limited to a specific area, or their participation was widespread throughout the project. Their primary role up to this point has been to identify and report all the aspects of this project that could affect its success or failure. The results of their findings were forwarded to those who have the task of making the decisions to proceed and take the project forward to the transition phase. At this phase of the project, the stakeholders should be reduced to the smallest number necessary to ensure that the project moves forward, but not at the expense of turning original stakeholders away from supporting it. Balance is critical at this point. Too many stakeholders can impede the process of implementation; too few and/or a poor selection of key individuals in this process could develop a lack of confidence. Thus, failure could be a possibility.

An analysis of the list of stakeholders resulted in the identification of four individuals as being critical to this project's implementation. Those individuals were identified as the City Manager, the Chief of Police, the Police Officers Association (POA), and the police department's Database Administrator.

City Manager

As the chief administrative officer for the city and the most direct link to the City Council, the City Manager has the final say over funding recommendations relating to the police department. Although his support would not be critical to the police department's efficiency, it would be critical to any strategies related to the acquisition of funding.

Chief of Police

As the chief executive officer of the police department, the Chief clearly sets the tone for organizational philosophy, priorities, goals and objectives. The Chief is primarily responsible for influencing the direction of the department and its personnel. The Chief is also the direct link between the department and the City Manager, which makes him the direct link to the City Council, which controls all of the funding.

Peace Officers Association (POA)

The POA represents a majority of the personnel working at the police department. It primarily addresses issues associated with wages, benefits and working conditions. The introduction of this type of technology into the workplace, even if welcomed by the rank and file,

may cause a significant change in the working environment for the employees it represents. Support from the POA for such a project may prevent unforeseen problems that may develop as this transition progresses toward implementation.

Police Department Database Administrator

The police department Database Administrator has the responsibility of assuring that the entire department's technology systems remain secure and operational. His role in this transition strategy may become critical in assessing the compatibility with the other systems throughout the other city departments and other governmental systems. Historically, the Database Analyst represents the police department in all technology projects, from its inception to its conclusion.

Transition Plan

The implementation of this type of technology can elicit a range of emotions throughout the organization. This range of emotions varies from person to person and can vary from an individual's fear of change from what is expected, or what is considered normal, to a range of excitement that includes learning something new to making one's job easier and safer. When putting a transition plan together, one should incorporate strategies that provide information, solicit and encourage involvement, and make available meaningful training. A brief explanation of these concepts is provided below:

Information

Communication within an organization is crucial to its success and credibility. When

non-critical information is kept in secrecy, especially on projects that could have a direct impact on one's working environment, it causes a variety of problems that sometimes are never fully solved. The lack of information to the rank and file may cause many to speculate, encourage one to draw his own conclusions on misinformation and give rise to rumors. The passing of misinformation in an organization can undermine the best efforts of those who truly intend to improve the working environment for all. Such efforts by those who participate in such discussions should be stopped, and the correct information should be provided when possible. Those involved in the project should make these corrections immediately; and most certainly, those in leadership roles must act decisively to stop the passing of misinformation and rumors.

Involvement

The best solution for any change or transition in any organization is to involve many, and as early as possible. Regardless of how little one's participation may be, even if it is nothing more than providing information and asking for an opinion, it goes a long way in making a transition easier to progress. Involvement instills a feeling of ownership, which produces the very best salesmen for any change or project to proceed with as little hindrance as possible.

Training

Law enforcement certainly understands the value of training. It is key to the safety of our personnel and the efficiency of our organization in the performance of its day-to-day responsibilities. The importance of training cannot be overstated in the success of a project such as this. The absence of meaningful hands-on training during the implementation of this

technology project will certainly end in a failed program.

Transition Management Structure

Because this is a technology project that is specifically designed for use by police officers from the police department, the most logical choice to head the project would be the Chief of Police. Although the Chief would report to the City Manager, as previously outlined in the critical mass, the Chief would be in the best position to influence the other key players as the project transitions into implementation. The Chief is in a position of advantage, due to his personal experience and knowledge of the organization. In contrast, the organization has shared his vision, philosophy and historical commitment to provide the best the industry has to offer.

Now that the Chief has been delegated as the project manager for this mission, he will most certainly delegate the responsibilities associated with the development and implementation of the project to members of his staff. They, in turn, will organize teams and appoint key individuals to head up the various segments of the project. The Chief will continue to be the liaison between the critical stakeholders, such as the City Manager and the POA, and will maintain open communications in which information and progress reports can be exchanged. The Chief will continue to inform, solicit support and convey his vision of the objectives that are to be sought.

SECTION FIVE

CONCLUSION

How will voice-activated technology be applied to police patrol functions by the year 2006? The findings of this project suggest that voice-activation technology will find its way into the law enforcement industry in short order. The California Highway Patrol reports that it will be introducing voice-operated emergency equipment in its patrol vehicles within the year. The auto industry is offering voice-activated accessories in their current production cars in response to the desires of their consumers. As consumers become familiar and comfortable with the use of these products in their cars, and they experience and report improved safety while driving, it is inevitable that the technology industry will respond to that demand.

The National Highway Traffic Safety Administration reports significant increases in traffic accidents where the primary collision factor involves inattention on the part of drivers; due to cell phone or vehicle accessory use.[7] Patrol officers are not immune to this phenomenon. The reality is that officers are more vulnerable to these mishaps because of the vast assortment of equipment they must operate while driving. It is a safe assumption that, if we can keep the officer's eyes on the road and hands on the wheel while driving, the number of collisions is sure to decline. For this reason alone, voice-activation technology may contribute to the success of that effort.

Voice-activation has made significant advancements in the area of report preparation and transcription. The computer hardware is continuing to improve and will be more adaptable to mobile environments in the future. The transition of preparing police reports from an office

environment by voice to the interior setting of a patrol vehicle will undoubtedly become a reality.

To move forward and implement these various systems as they become available and can demonstrate benefit to the organization is recommended. The challenge for leadership is not to shy away from the inevitable. The technology is going to move forward in spite of any efforts to dissuade its progression. Leadership should keep an open mind and explore the possibilities when considering the implementation and use of voice-activation products.

History has demonstrated that computer technology will continue to evolve and be part of day-to-day operations in law enforcement, now and long into the future. The implementation of a voice-activated system within the patrol function in the near future is just another extension of that evolution. The transition from a No. 2 pencil and paper to the current computerized systems has certainly had its share of failures and challenging moments. Those with a number of years on the job have experienced many days of frustration during some of the various transitions; and they have often found themselves regressing back to the more traditional, proven ways of getting things accomplished.

As time has passed, officers have become more and more dependent on these systems to access and retrieve the resources they seek with more and more efficiency and ease. The fear of not understanding and manipulating these systems has subsided, as the officers continue to gain more and more confidence in their abilities and desire for instant results. The fear has now shifted from one's self-confidence to a fear that these systems may crash at any moment, thus completely disrupting one's day. Now in question is what to do and where to go when these systems fail.

As time passes, the new generations of men and women who enter law enforcement bring

more experience and knowledge about technology-based systems. They are very comfortable with their usage and extremely dependent on their availability. These younger generations also bring a wealth of knowledge and information about how these systems can be developed and enhanced. They are a resource that can and should be utilized in taking law enforcement's technology needs to the next level.

Voice technology is that next level in this continuing evolution, for the foreseeable future. This is certainly the consensus of the experts who were referred to in this project. Applications for the uses of this technology in vehicles have been, and will continue to be developed and implemented as the benefits for such uses are discovered. As outlined in this project, there are a variety of applications that can be adapted and applied to our day-to-day operations in our patrol vehicles. These applications offer enhanced efficiency and improved safety for the officers as they perform their duties.

This organization should actively seek all the tools and resources available or adaptable for use. The officers, as well as the communities served, expect it and deserve the benefits they have to offer. That theme has been the inspiration that has spurred the progress of this project, with the ultimate goal of implementing some, or all, of those future technologies portrayed to become a reality.

APPENDIX - A

Nominal Group Technique (NGT) Panelist List

Panelists:

Art Brown   Mayor Pro Tem for the City of Buena Park

Winton Burnett   Regional Director for the United States Postal Service

Thomas Cirillo   Loan Officer for Coast Mortgage

Jack Delpit   Director of Sales for Dragon Systems, Inc.

Robert Gonzales   Administrative Lieutenant for the Buena Park Police Department

Henry Majoue   Director of Sales for Voice Automated

Pamela Regan PhD   Associate Professor and Director, Social Relations Lab, Department of Psychology, California State University, Los Angeles

Kristie Repp   1SG United States Army Reserve

David Serrano   Risk Manager for the City of Buena Park

Facilitators:

Robert R. Chaney Jr.   Captain - Buena Park Police Department

Richard Ciampa   Captain - Buena Park Police Department (CC Class 27)

APPENDIX – B

Trend List

TREND: A trend is a series of occurrences, when viewed together, that indicate a movement in a particular direction. The movement can be perceived as positive or negative.

Trends – Initial Brainstorming List

1)   Accountability of Police Officers *
2)   Personal Safety of Officers *
3)   Computer Hardware Improving
4)   Gen X New Hires
5)   Ergonomics *
6)   Need for Documentation *
7)   Standardization of Technology *
8)   Available Budget *
9)   Expectation for User Friendly Technology
10)   Costs vs. Productivity *
11)   Voice Recognition Integrated Into Workplace
12)   Reliance on Technology *
13)   Multiple Applications for Voice Recognition Technology
14)   Security of Voice Activated System *
15)   Civilian Use of Military Technology
16)   Multi-Tasking Expectations *
17)   Stress
18)   Back to Basics
19)   Depersonalization
20)   Civil Rights / Privacy Issues

* Indicates final list of trends

APPENDIX – C

Event List

EVENT: A one time singular occurrence.

Events – Initial Brainstorming List

1)   Leadership Changes *

2)   Nationwide Computer Crash

3)   Evaluation of Technology

4)   Internet Facilitation

5)   Hands-Free Environment Mandated *

6)   3000 MHz Processor Developed *

7)   Computers Equipped with Voice-Activation as Standard Equipment *

8)   Opposition from Police Unions *

9)   Major Disaster Hits Southern California

10)   Major Recession *

11)   Elimination of Federal Technology Funding *

12)   Voice-Activated Technology Discovered to Have Major Negative Health Issues

13)   National Strike of Computer Technicians *

14)   Federal Ban on Work Visas for Foreign IT Professionals

15)   National Standards for Reporting Crimes

* Indicates final list of events

APPENDIX – D

Software Minimum System Requirements

Dragon NaturallySpeaking® Public Safety Solutions 5.0

- ☐ Microsoft® Windows® 98/2000/Millennium or Microsoft® Windows NT® 4.0 (with SP-6 or greater)

- ☐ 266 MHz Intel® Pentium® processor with MMX® or equivalent. For best results, a 500 MHz processor or faster is recommended.

- ☐ 128 MB RAM (144 MB RAM or Windows® 2000/Millenium/NT® 4.0) or greater. (256 MB recommended for best accuracy)

- ☐ 195 MB free disk space (150 MB to install Dragon NaturallySpeaking Professional 5.0, 5 MB to install L&H™ SpeechLinks and 40 MB to install L&H™ SpeechDocs Filler)

- ☐ Certified sound card (hardware compatibility at http://www.talktoyourcomputer.com/certified hw.htm)

- ☐ CD-ROM for installation

- ☐ Speakers

- ☐ Noise-canceling microphone

IBM ViaVoice 8 Professional

- ☐ Microsoft® Windows® 95, Windows 98, Windows 2000, or Windows NT® Workstation 4.0 with Service Pack 5: Intel® Pentium® 300 MHz processor and 256K L2 cache or equivalent (including AMD-K6® with 256K L2 cache)

- ☐ Windows Me: Intel® Pentium III 600 MHz and 256K L2 cache (including AMD-K6® with 256K L2 cache)

- ☐ 64 MB RAM for Windows 95/98/Me/NT 4.0

- ☐ 96 MB RAM for Windows 2000

- ☐ Windows 95/98/Me/NT 4.0/2000 compatible 16-bit sound card with microphone input jack or USB port for USB microphone input.

- ☐ 510 MB of available hard drive space

- ☐ Quad-speed CD-ROM drive or faster

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[3]   Jose Castrellon, personal interview, Buena Park, Ca., September 9, 2000

[4]   James Banks, personal interview, Buena Park, Ca., September 3, 2000

[5]   Stephen Treisman, personal interview, Buena Park, Ca., August 8, 2000

[6]   Martine Kempf, "Katalavox," (Sunnyvale, Ca.), Katalavox History, 1995 [Website]; available from http://katalavox.com/katahis1.htm: accessed 9 October 2000.

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[13]   Delbecq, A. Van de Ven & D. Gustafson, *Group Techniques for Program Planning: A Guide to Nominal Group and Delphi Processes,* (Middleton WI: Green Briar Press 1975/1986

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